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ABSTRACT

Inventories designed to measure confidence in dangerous situations were administered to about 3,000 potential Army aviation warrant officers from January to December 1967. These paper-and-pencil inventories are based on a clinical-experimental fractional anticipatory response conceptualization of reactions to the psychological stresses of combat. Military performances of the men are subjected to longitudinal analysis to determine the relationship of scores on these inventories to various criterion performances. In this paper relationships of scores on two of these inventories--the Background Activities Inventory and the Situational Confidence Inventory--to peer ratings, attrition during flight training, and accident information are presented. (Author)

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Background and Situational Confidence: Their Relation to Performance Effectiveness

by

Wiley R. Boyles

Presentation at the
Alabama Psychological Association
Annual Meeting
Birmingham, Alabama April 1968

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Prefatory Note

This paper was presented at the 1968 meeting of the Alabama Psychological Association held in Birmingham, May 1968. Reference is made herein to a paper given by Peter R. Prunkl and Wiley R. Boyles, titled, "A Preliminary Application of the Critical Incident Technique to Combat Performance of Army Aviators," which succeeded the present paper on this program. The two papers constitute an overview of current research on psychological stress conducted by the Human Resources Research Office Division No. 6 (Aviation), Fort Rucker, Alabama, under Exploratory Study 50, Aviator Stress.

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BACKGROUND AND SITUATIONAL CONFIDENCE; THEIR RELATION TO PERFORMANCE EFFECTIVENESS

Wiley R. Boyles

It is a rare human being who has not received some training designed to enable him to operate effectively in a psychologically stressful situation. Whether we are dealing with a child and advising him not to cross the street when a car is coming, or to hurry when a car *is* coming—whether we are teaching baby not to put his finger on the eye of the stove when it is red—whether we are teaching an astronaut how to cope with the dangerous unknowns of an orbital or interplanetary trip, in all of these situations, we are attempting to train people to escape from danger without suffering physical harm.

It is unfortunately true that there are some situations in which people must be trained to operate effectively while deliberately exposing themselves to danger. This is especially the case in the military situation. We know very little, compared to what we would like to know, about how to design training—how to tailor the learning experience to provide the trainee with effective "tools" to insure minimum deterioration of his performance on the job when he is in danger of being killed.

The general importance of research in stress has been reflected in a number of reviews over the past 20 years and in thousands of individual research efforts, ranging in specific content from differential handling of mice in the immediate post-weaning stage (as a preparation for experimental stresses to be applied to the subjects as adults), to achieving brief periods of weightlessness by violently maneuvering a high-performance aircraft to give a potential astronaut momentary contact with a type of problem encountered in space.

The importance of that portion of stress research directly pertinent to performance in combat is perhaps best emphasized by quoting the amount to be spent on military training in FY 1969: $4.4 billion dollars. (Of this, $1.5 billion will be used for aviation training.)

The best-known attempt to describe the performance problems of the combat soldier is the work of S.L.A. Marshall during World War II and Korea. Marshall's estimates indicate that during a combat engagement in the Korean War about 12% to 20% of the men in a given unit would be functioning very effectively; another 25% to 35% would vacillate back and forth across the borderline of effectiveness, and from 45% to 63% would not be providing fire support. Military officers who were commanders in Korea have not generally agreed with Marshall, making much lower estimates of the proportions of men who were not firing during combat (1). However, they do agree that the problem of developing

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ways to improve effectiveness of individual performance under combat stress is of tremendous importance in preparing for future military needs.

The Human Resources Research Office has been engaged since the Korean War in research aimed toward development of approaches through training to improving the individual's ability to function effectively under the stresses of combat. Our major effort in this area has been conducted by Division No. 3 (Recruit Training), of HumRRO, Presidio of Monterey, California, and is reflected in a number of publications including a 1962 Psychological Monograph, by Berkun, *et al.* (2). The most recent publication of this research has been a Technical Report entitled, *A Conceptual Model of Behavior Under Stress, With Implications for Combat Training* (1).

In this publication, a conceptualization of the behavioral reactions of individuals exposed to prolonged intense combat stressor conditions is developed. The conceptualization assumes that the reactions of individuals "can be ordered into phases which, over the course of time, form an observable pattern." This pattern, it is believed, will develop in any person exposed to threats of severe physical harm over a period of time, if that period is sufficiently prolonged. The reaction process as manifested in behavior, is analyzed in an S-O-R framework.

To quote directly from Kern (1),

> The behavioral features of this reaction process have been grouped into three successive stages in which effectiveness of combat performance differs:
>
> a. In Stage 1 the individual is responding primarily to performance or job-centered stimuli.
>
> b. In Stage 2 he is responding primarily to harm or threat stimuli, and his behavior reflects his concern with the dangers in his environment in place of his earlier job-performance concerns.
>
> c. Stage 3 is marked by the absence of overt behaviors in response to either job-performance or danger-relevant stimuli.
>
> The progression of the individual's behavior from one stage to the next is assumed to be gradual. In the shift from Stage 1 to Stage 2, for example, danger-oriented behaviors would intrude more and more often and would temporarily block out what had been ongoing job-centered behaviors of Stage 1. These intrusions would increase in frequency and duration until the individual's behavior was almost exclusively the Stage 2 type.

Mr. Prunkl will discuss these stages in more detail in a paper to be presented at this meeting (3). Again, to quote from Kern,

> The rate and extent of the changes in stimulus orientation are represented as a function of an ongoing interaction between environmental physical harm threat conditions and certain types of personality resources. Thus, changes in an individual's stressor environment can accelerate, retard, or even reverse the development of this behavioral pattern. In identical environmental stressor conditions, different individuals possessing different strengths of the important personality

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resources move through these stages of behavioral reactions at different rates.

The internal effects of this ongoing interaction between the individual's personality resources and his stressor environment, described in terms of the resulting shifts in stimulus orientation with their respective accompanying behavioral reaction characteristics, are labeled the 'stress process.'

The conceptual model attempts to render this concept of a stress process experimentally useful by identifying two attitudinal variables as the key personality resource factors. Those opposing attitudinal factors—labeled Confidence and Despair—play major roles in regulating the individual's stimulus orientation to job or danger cues, and hence the rate and extent of development of the stress process.

The Confidence attitude is characterized by an anticipation of being able to successfully control one's environment (i.e., to cope with the physical threat aspects in a situation) while the Despair attitude is characterized by an anticipation of the impact of the physical threat consequences (i.e., injury or physical destruction). The strength of each of these two attitudes in turn derives from two components: (a) a general component (background confidence, background despair) which is based on the individual's entire history and hence by adulthood is relatively resistant to change, and (b) a specific component (situational confidence, situational despair) which is based on experiences in situations highly similar to a present one and is relatively amenable to change.

An individual's stress resistance is assumed to be a function of the absolute strength of the Confidence attitude (background and situational confidence) and the extent to which this strength exceeds that of his Despair attitude (background and situational despair).

In general, it is assumed that in preparing an individual for combat or other hazardous jobs, training should be considered in terms of the specific or situational confidence and despair components. Training designed to maximize the strength of the situational confidence component and, at the same time, minimize increases in the strength of the situational despair component should result in greater stress resistance when the individual is subsequently in the hazardous job situation. . . .

In developing and evaluating stress-retardant training, a capability to assess the strengths of the background and situational components of the trainee's Confidence and Despair attitudes would be a necessary element. Exploratory research at Monterey resulted in development of an activities inventory for assessing the background components and a confidence/despair rating for assessing the situational components.

We will refer to these respectively as the Background Activities Inventory (BAI) and the Situational Confidence Measure (SCM). Examples from these measures are shown in Figures 1, 2, and 3.

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Background Activities Inventory I

Answer these questions by filling the appropriate spaces in the Left-Hand column of the answer sheet labeled "Inventory I."

1. I have played soccer:
   (a) never (b) few times (c) often (d) very often

2. I have played tackle football:
   (a) never (b) few times (c) often (d) very often

3. I have engaged in skeet and target shooting:
   (a) never (b) few times (c) often (d) very often

4. I have engaged in ice hockey:
   (a) never (b) few times (c) often (d) very often

5. I have played rugby:
   (a) never (b) few times (c) often (d) very often

6. I have engaged in boxing:
   (a) never (b) few times (c) often (d) very often

7. I have gone snow skiing:
   (a) never (b) few times (c) often (d) very often

8. I have engaged in judo:
   (a) never (b) few times (c) often (d) very often

9. I have gone swimming:
   (a) never (b) few times (c) often (d) very often

10. I have engaged in surfboard riding:
    (a) never (b) few times (c) often (d) very often

11. I have gone water skiing:
    (a) never (b) few times (c) often (d) very often

12. I have gone horseback riding:
    (a) never (b) few times (c) often (d) very often

13. I have engaged in water polo:
    (a) never (b) few times (c) often (d) very often

14. I have gone skin diving:
    (a) never (b) few times (c) often (d) very often

15. I have driven a truck or truck-trailer:
    (a) never (b) few times (c) often (d) very often

16. I have gone boating or canoeing:
    (a) never (b) few times (c) often (d) very often

Figure 1

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Background Activities Inventory II

Be sure to use the two Right-Hand columns on the answer sheet to answer the following questions. Use column "A" to answer the (A) part of each question and column "B" to answer the (B) part. Be sure to answer both part (A) and part (B) for each question.

1. During the times that I have played soccer, I can remember having felt:

(A)		(B)	
a confident "I can handle anything that comes up" feeling		an "a guy could get hurt doing this" feeling	
(1) never	(3) many times	(1) never	(3) many times
(2) few times	(4) most times	(2) few times	(4) most times

2. During the times that I have played tackle football, I can remember having felt:

(A)		(B)	
a confident "I can handle anything that comes up" feeling		an "a guy could get hurt doing this" feeling	
(1) never	(3) many times	(1) never	(3) many times
(2) few times	(4) most times	(2) few times	(4) most times

3. During the times that I have engaged in skeet and target shooting, I can remember having felt:

(A)		(B)	
a confident "I can handle anything that comes up" feeling		an "a guy could get hurt doing this" feeling	
(1) never	(3) many times	(1) never	(3) many times
(2) few times	(4) most times	(2) few times	(4) most times

4. During the times that I have engaged in ice hockey, I can remember having felt:

(A)		(B)	
a confident "I can handle anything that comes up" feeling		an "a guy could get hurt doing this" feeling	
(1) never	(3) many times	(1) never	(3) many times
(2) few times	(4) most times	(2) few times	(4) most times

5. During the times that I have played rugby, I can remember having felt:

(A)		(B)	
a confident "I can handle anything that comes up" feeling		an "a guy could get hurt doing this" feeling	
(1) never	(3) many times	(1) never	(3) many times
(2) few times	(4) most times	(2) few times	(4) most times

Figure 2

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Situational Confidence Measure

Print the following information:

Name: _____

Army Serial Number: _____

Company: _____

Date: _____

INSTRUCTIONS

USE THE PAIR OF WORDS LISTED ON THE OTHER SIDE OF THIS SHEET TO DESCRIBE YOUR PRESENT KNOW-HOW OR SKILL WITH THE M14 RIFLE IF, WITHOUT FURTHER TRAINING, YOU HAD TO RELY ON YOUR ABILITY TO USE THE M14 EFFECTIVELY IN COMBAT.

Place your mark in any one of the seven spaces between each pair of words. The closer your mark is to one word of the pair means the closer you feel that word comes to describing you and the less descriptive is the other word of the pair.

If you think one of the words does not fit you any better than the other word of the pair, then fill in the space mid-way between the two words.

For example, if you feel the word "good" describes very closely your present know-how or skill in using the M14 rifle in combat then you would blacken in the space closest to the word "good."

	1	2	3	4	5	6	7	
BAD	∩	∩	∩	∩	∩	∩	▮	GOOD
	U	U	U	U	U	U		

	1	2	3	4	5	6	7	
WEAK	∩	∩	∩	∩	∩	∩	∩	STRONG
	U	U	U	U	U	U	U	
HOPELESS	∩	∩	∩	∩	∩	∩	∩	HOPEFUL
	U	U	U	U	U	U	U	
WORST	∩	∩	∩	∩	∩	∩	∩	BEST
	U	U	U	U	U	U	U	
UNSKILLED	∩	∩	∩	∩	∩	∩	∩	SKILLED
	U	U	U	U	U	U	U	
FAILURE	∩	∩	∩	∩	∩	∩	∩	SUCCESSFUL
	U	U	U	U	U	U	U	
DOOMED	∩	∩	∩	∩	∩	∩	∩	SAFE
	U	U	U	U	U	U	U	
HELPLESS	∩	∩	∩	∩	∩	∩	∩	MASTERFUL
	U	U	U	U	U	U	U	
BUNGLING	∩	∩	∩	∩	∩	∩	∩	EXPERT
	U	U	U	U	U	U	U	
AWKWARD	∩	∩	∩	∩	∩	∩	∩	SMOOTH
	U	U	U	U	U	U	U	
LOSER	∩	∩	∩	∩	∩	∩	∩	WINNER
	U	U	U	U	U	U	U	
DOUBTFUL	∩	∩	∩	∩	∩	∩	∩	CONFIDENT
	U	U	U	U	U	U	U	
UNLUCKY	∩	∩	∩	∩	∩	∩	∩	LUCKY
	U	U	U	U	U	U	U	
TIMID	∩	∩	∩	∩	∩	∩	∩	BOLD
	U	U	U	U	U	U	U	

Figure 3

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The Confidence and Despair attitudes (combined background and situational components) are conceived as mutually incompatible internal, anticipatory responses. Within this frame of reference, one or the other of these two attitudes must be the predominant influence in the individual's reaction at any time. These attitudes include stimuli internal to the individual. Each one makes a particular, different set of response hierarchies available and, in effect, excludes others, by bringing about orientation to a particular category of cues or stimuli.

Thus, at any given point in time, behavior under stress would be described as characteristic of either the 'Confidence state' or the 'Despair state.' The third stage of the stress process described earlier represents an extreme development of the 'Despair state.'

Because of the effects of the Confidence and Despair attitudes in regulating stimulus orientation, an individual's resistance to stress depends upon the relative and the absolute strengths of these two attitudes. The relative strengths determine which attitudinal factor, Confidence or Despair, is dominant at any given time. The strength of the one that is dominant influences the strength of the stimulus orientation.

The model of the stress process was developed in order to provide a framework that would facilitate synthesis of information collected on individuals' reactions to severe stress experiences. The clinical insights, field and laboratory observations, and theoretical formulations of clinicians and experimental psychologists representing divers frames of reference were all considered important to this effort. Under this influence, development of this model quickly diverged from relatively simple elaborations of any single, existing theoretical formulation.

A special debt of acknowledgment is due a number of investigators. The hypotheses developed by Janis in his work with patients undergoing surgery had considerable influence on the thinking regarding the functional role of the psychological variables involved in behavior under stress. (4) In attempting to make the resulting concepts and their interrelationships more explicit, the author's approach was strongly influenced by the theoretical formulations of Hull (5, 6) and Mowrer (7, 8).

The considerations that guided development of the model can perhaps best be indicated by characterizing it as a clinical-experimental model. In general structure, it reflects Mowrer's definition of a two-factor theory (7).

The model is an S-O-R model. It seeks to account for the development of internal (O) factors that act to regulate the stimuli (S) to which the individual is oriented and thus plays an important role in determining the types of response (R) behavior he will exhibit during given segments of time. These internal factors are labeled Confidence and Despair. While they have some similarity to Mowrer's concepts of 'hope' and 'fear,' there are important differences. In addition to their stimulus orienting function, the Confidence and Despair factors account for consistency from situation to situation in a person's behavior and also account for departures from the individual's modal style in specific circumstances. From this point of view, this model represents a relatively circumscribed approach to the problems discussed by White in his initial proposal of the concept of competence (9). . . .

The function of a conceptual model is to serve as a guide to ways of approaching problems. The conceptual model of the stress process

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has been used both for analysis of implications for research on stress-retardant training and for analysis of training itself, to explore aspects related to retarding the stress process. . . .

Methods for increasing effectiveness of combat performance could be two general types: Those applied prior to exposure to the severe stressor environment (combat), and those applied during exposure to the severe stressor environment. This discussion will be concerned primarily with the precombat, or training application. Thus, in discussing implications of the conceptual framework for efforts to increase stress resistance, we move backward in time from the setting of the stressor situation to that of the pre-exposure training situation.

One general implication of the model is obvious: Training for stress resistance must be designed so as to produce differential effects in the strengths of the Confidence and Despair response tendencies that will be effective when the individual is under the actual stress conditions for which he is being prepared. The differential effects sought are (a) maximal strengthening of the Confidence response tendency to relevant cues that will be encountered in the stress situation, and (b) at the same time restricting, to a minimum, increases in the strength of the Despair response tendency to cues that will be encountered in the stressor situation.

It seemed likely that the Kern research approach, although designed for continuous combat exposure rather than the intermittent exposure of the aviator, would be useful in the Army aviation situation. Therefore, in January 1967, HumRRO Division No. 6 at Fort Rucker, Alabama, began to administer the Background Activities Inventory and the Situational Confidence Measure, designed to measure the confidence and despair attitudes, at the Army Induction Center, Fort Polk, Louisiana. Subjects were individuals coming directly into the Army aviation program from civilian life who had been given the flight training option; that is, men guaranteed flight training as a condition of their enlistment—providing they successfully complete basic training.

Our first criterion for a decision to use the instruments in the aviation situation was based on the following logic: Experience with and reactions to danger (a) on a lifetime basis, and (b) in specific situations, determine a man's willingness to further expose himself to danger. Those individuals with higher confidence in themselves in dangerous situations will be more likely to expose themselves voluntarily to further danger. The general conception of flying held by the young American male is that it is dangerous. Therefore, young men who come in the Army having volunteered to fly will have more confidence in themselves in dangerous situations than will young men who come in the Army but have not volunteered to fly. In order to be practical for our use, the instruments should distinguish on this basis.

Our first study, therefore, was a comparison of scores on our behavioral activities inventory of 532 volunteer potential aviators and 440 young men from the general basic combat training population. Results are shown in Figure 4. The difference between means is significant at the .005 level. The instrument, still of unknown validity and reliability, met its initial test.

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Distribution of Background Confidence Scores for Aviation and Non-Aviation BCT Trainees

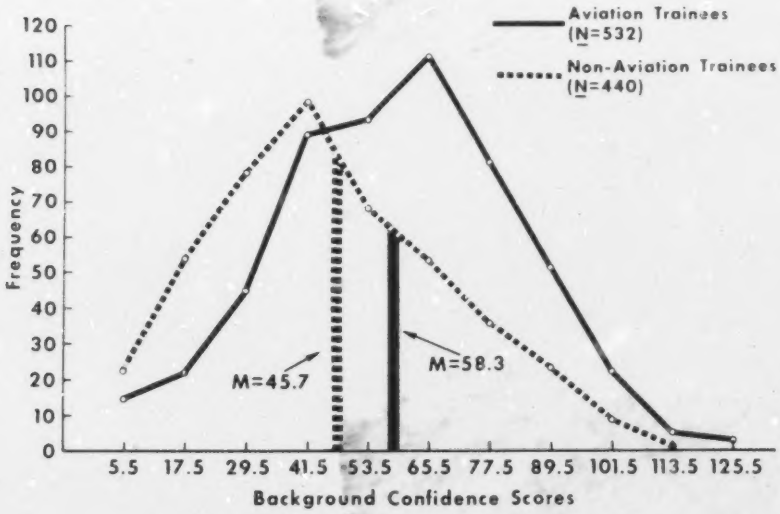

Figure 4

Our next effort had to do with the test-retest reliability of the Background instrument. We conducted two studies—one at Fort Rucker, with a non-aviation group—over a four-week inter-test interval—as a pilot study, and one—over a ten-week inter-test interval. The first administration in this study was conducted at Fort Polk, Louisiana, the second at Fort Wolters, Texas; the results are shown in Table 1.

Table 1

Background Inventory Reliability Studies

Location	*N*	Inter-test Interval	Scale	Coefficient	Type
Fort Rucker, Alabama	81	4 weeks	Background Confidence	.80	Pearson *r*
Fort Rucker	81	4 weeks	Background Despair	.63	Pearson *r*
Fort Polk, Louisiana Fort Wolters, Texas	146	10 weeks	Background Confidence	.80	Pearson *r*
Fort Polk Fort Wolters	146	10 weeks	Background Despair	.47	Pearson *r*

The Background Activities Inventory and its component confidence measures seemed to be sufficiently stable. We did not anticipate perfect stability because background activities are modified over time by new experiences. (The background component for an 18-year-old, however, should be relatively stable.) The Background Despair measures

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needed further work. We have revised them, but we have not analyzed our results at this time, having concentrated on further tests of the confidence measures.

Our next project was to attempt to adapt the Situational Confidence measures to the aviation situation. Therefore, we adapted the measures as shown in Figures 5, 6, and 7. We have moved from the situations used in the earlier research—infantry combat situations—to three situations in aviation training that might be perceived as dangerous by the new aviator: The first solo period, the first solo autorotation period, and the first pinnacle landing period. To explain the rationale for choosing these points:

(1) Flight students generally develop confidence, *in* their instructor and *in* the aircraft very quickly—so that they feel quite comfortable after the first few flights. However, the realization that sooner or later they are going to have to go up by themselves without the "father figure" to get the craft back down again often is rather stressful. For this reason we chose the first solo period.

(2) Autorotation in a helicopter refers to the situation in which one descends without power—it is rather like a fast-falling elevator—except for the last few feet, in which some very complex stimulus-response sequences must be correctly accomplished to avoid a disastrous landing. Helicopter student pilots report that after a few solo flights, one may feel fairly comfortable flying around in the aircraft and yet remain uncomfortable about the idea of deliberately cutting off the source of power and beginning this rapid descent.

(3) Finally, the helicopter, when hovering over flat terrain in that range of altitude from about 15 feet down to the ground--is operating on an easily discernible cushion of air created by its own rotor blades—so that when it gets down close to the ground at low or zero air speeds one definitely feels the added lift. However, when an attempt is made to land on a peak or pinnacle, the air rushes down the side of the pinnacle, and the cushion does not exist. Hence, the first occasion in which the student has to attempt to bring the aircraft down safely without this supportive cushion gives him a new problem.

We have generated a small intercorrelation matrix for the first 100 people for whom we have complete results on this series of tests, because we were too impatient to wait until our *N* was large enough for formal analysis. The intercorrelation matrix is shown in Table 2. It may be seen that the intercorrelations are not at odds with the conceptualization nor with considerations of reliability.

Next, while waiting for the ultimate test of our materials, which will be performance in combat, we have compared our instruments with some early indices of performance, data of opportunity that are generated by the Army on all its potential aviators. One of these is the leadership potential rating (10). It is a peer rating developed by the U.S. Army Behavioral Sciences Research Laboratories (formerly the U.S. Army Personnel Research Office), and is a well-tested instrument. It has been shown to be positively related to quality of performance in a number of military situations. We have performed the

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Situational Confidence Measure I: First Solo Period

Print the following information:

Name:_____ Date: _____
Last First Middle

Army Service Number:_____

Company:_____ Age:_____

Number of hours in OH-23 aircraft: Dual_____
Solo_____

Number of hours in TH-55 aircraft: Dual_____
Solo_____

Describe, using the choices below, your aviation experience prior to coming to Fort Wolters:

Fixed wing hours____
Rotary wing hours___

☐ Check this box if no aviation experience prior to present training.

INSTRUCTIONS

USE THE PAIRS OF WORDS LISTED ON THE OTHER SIDE OF THIS SHEET TO DESCRIBE YOUR PRESENT ABILITY TO PILOT THE OH-23 OR TH-55 HELICOPTER SOLO IF, WITHOUT FURTHER TRAINING, YOU HAD TO RELY ON YOUR ABILITY TO FLY THE AIRCRAFT EFFECTIVELY IN COMBAT.

Place your mark in any one of the seven spaces between each pair of words. The closer your mark is to one word of the pair means the closer you feel that word comes to describing you and the less descriptive is the other word of the pair.

If you think one of the words does not fit you any better than the other word of the pair, then fill in the space midway between the two words.

For example, if you feel the word "good" describes your ability a little better than the word "bad" you would blacken the space to the right of the middle space.

EXAMPLE:

	1	2	3	4	5	6	7	
BAD	∩	∩	∩	∩	▌	∩	∩	GOOD
	∪	∪	∪	∪		∪	∪	

Answer all items on the reverse side of this sheet.

Figure 5

Situational Confidence Measure IIA: First Solo Autorotation Period

Print the following information:

Name:_____ Date:_____
Last First Middle

Army Service Number:_____

Company:_____ Age:_____

Number of hours in OH-23 aircraft: Dual_____
Solo_____

Number of hours in TH-55 aircraft: Dual_____
Solo_____

INSTRUCTIONS

USE THE PAIRS OF WORDS LISTED ON THE OTHER SIDE OF THIS SHEET TO DESCRIBE YOUR PRESENT ABILITY TO PERFORM AN AUTOROTATION IN THE OH-23 OR TH-55 AIRCRAFT IF, WITHOUT FURTHER TRAINING, YOU HAD TO RELY ON YOUR ABILITY TO PERFORM THIS MANEUVER EFFECTIVELY IN COMBAT.

Place your mark in any one of the seven spaces between each pair of words. The closer your mark is to one word of the pair means the closer you feel that word comes to describing you and the less descriptive is the other word of the pair.

If you think one of the words does not fit you any better than the other word of the pair, then fill in the space mid-way between the two words.

For example, if you feel the word "good" describes your ability a little better than the word "bad" you would blacken the space to the right of the middle space.

EXAMPLE:

	1	2	3	4	5	6	7	
BAD	∩	∩	∩	∩	▌	∩	∩	GOOD
	∪	∪	∪	∪		∪	∪	

Answer items on the reverse side

Figure 6

Situational Confidence Measure III: First Pinnacle Landing Period

Print the following information:

Name:_____ Date:_____
Last First Middle

Army Service Number:_____

Company:_____ Age:_____

Number of hours in OH-23 aircraft: Dual_____
Solo_____

Number of hours in TH-55 aircraft: Dual_____
Solo_____

INSTRUCTIONS

USE THE PAIRS OF WORDS LISTED ON THE OTHER SIDE OF THIS SHEET TO DESCRIBE YOUR PRESENT SKILL IN PILOTING THE OH-23 OR TH-55 HELICOPTER IN CONFINED AREAS, AND AROUND PINNACLES AND SLOPES IF, WITHOUT FURTHER TRAINING, YOU HAD TO RELY ON YOUR ABILITY TO MAKE THESE MANEUVERS EFFECTIVELY IN COMBAT.

Place your mark in any one of the seven spaces between each pair of words. The closer your mark is to one word of the pair means the closer you feel that word comes to describing you and the less descriptive is the other word of the pair.

If you think one of the words does not fit you any better than the other word of the pair, then fill in the space mid-way between the two words.

For example, if you feel the word "good" describes your ability a little better than the word "bad" you would blacken the space to the right of the middle space.

EXAMPLE:

	1	2	3	4	5	6	7	
BAD	∩	∩	∩	∩	▌	∩	∩	GOOD
	∪	∪	∪	∪		∪	∪	

Answer items on the reverse side.

Figure 7

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Table 2

Product-Moment Correlations for Confidence Measures:[a] Background Activities Inventory (BAI)—Situational Confidence Measure (SCM) Study

($N = 100$)

BAI Confidence	Fort Polk		Fort Wolters		
	SCM #1 M14 Rifle	SCM #2 M14 Rifle	SCM #3 First Solo	SCM #4 Autorotation	SCM #5 Pinnacle Landing
1.00	.03	-0.06	.08	.18	0.20*
	1.00	0.72**	-0.07	0.21*	0.09
		1.00	-0.10	0.04	0.12
			1.00	0.34**	0.17
				1.00	0.64**
					1.00

[a]*indicates $p<.05$; **indicates $p<.01$.

Pearson product moment correlation between the BAI scores and the leadership potential rating scores of 299 students. The correlation is .22. It seems that this peer rating, the average popularity ranking of the students during basic training, is slightly positively related (r=.22, N=299 is significantly different from zero $p<.001$) to the student's confidence in himself as measured by our confidence scales. However, the coefficient is certainly low enough to justify use of both in a predictor battery. HumRRO has another ongoing research project directed toward producing a predictor battery for the Army aviation system.

Another index of performance is pass or fail in flight training. Some people fail in the Army flight training because they lack aptitude, but we believe these are few. The beginning students have passed a number of aptitude filters in the Army's primary selection process. We think many men fail because they are afraid to fly. In view of this, we studied the distribution of confidence scores on the Background Activities Inventory of those students who were eliminated for flight deficiencies in two classes going through basic flight training in 1967. We compared them with the distribution of scores for successful students in those classes as shown in Table 3. (Success is defined as completing the program on time).

Table 3

Comparison of Background Activities Inventory (BAI) Confidence Scores: Flight Deficiency vs. Successful Students[a]

Student Categories	N	Percentile				
		10	25	50	75	90
Successful Students	281	630	1054	1500	2025	2560
Flight Deficiency Eliminated Students	30	460	572	936	1400	2028

[a]Warrant Officer Rotary Wing Aviator Course Classes 67-25 and 68-1 Combined.

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We compiled, in addition to the flight deficiency elimination median, median scores for students who have had accidents and for "setback" students. A student may be set back for flight deficiency, academic deficiency, or a prolonged medical hold when his class has moved too far ahead for him to catch up. A medical problem student may be grounded by the flight surgeon for medical reasons; he will remain in this status until prescribed medically fit and released for flying by the flight surgeon. Depending on the duration of the grounding, the student is either set back or returned to his "old" flight class, and for other students who resign. All these groups have in common a failure to complete the program on time. We compared these again with the median for successful students as shown in Table 4.

Table 4

Background Activities Inventory (BAI) Score Distributions[a]

Student Categories	*N*	Percentile 50
Flight Deficiency Eliminations	30	936
Accidents	20	1716
Setbacks	38	1470
Medical Problems	14	1287
Resignations	13	1296
Successes	378	1500

[a]Warrant Officer Rotary Wing Aviator Course Classes 67-25 and 68-1 Combined

Table 5

Background Activities Inventory (BAI) Confidence Scores--*t*-Test Results[a]

Student Categories	*t*	*p*
Normal Progress Students vs. Flight Deficiency Eliminations	2.33	<.02
Normal Progress Students vs. Accidents	1.69	<.10
Normal Progress Students vs. Setbacks	.08	
Normal Progress Students vs. Medical Problems	.37	
Normal Progress Students vs. Resignations	.90	

[a] Warrant Officer Rotary Wing Aviator Course Classes 67-25 and 68-1 Combined

There are interesting differences in these medians. The accident men have highest confidence medians, the flight deficiency elimination people lowest, setbacks and medical holds are intermediate. The *N*s are, of course, still rather low for formal analyses.

Table 5 shows *t*-test results for these groups compared with students who made normal progress in the combined classes on two-tailed tests.

Our formal analysis, when our *N*s are a bit larger, will be by analysis of variance methods, but the significance of the difference between means of normal progress students and those eliminated for flight deficiency has immediate implication for training and perhaps for secondary selection. I can say we are pleased with these preliminary results and that we await with some (subjective) anticipation of success the data from the combat zone which will provide the ultimate test of the instruments. We are also working on development of additional criteria of combat performance. Mr. Prunkl will discuss that part of our work (3). Too, we have had good results in predicting behavior by the questionnaire method with operational aviators. Mr. Boyd will discuss those results (11).

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13. ABSTRACT

Inventories designed to measure confidence in dangerous situations were administered to about 3,000 potential Army aviation warrant officers from January to December 1967. These paper-and-pencil inventories are based on a clinical-experimental fractional anticipatory response conceptualization of reactions to the psychological stresses of combat. Military performances of the men are subjected to longitudinal analysis to determine the relationship of scores on these inventories to various criterion performances. In this paper relationships of scores on two of these inventories—the Background Activities Inventory and the Situational Confidence Inventory—to peer ratings, attrition during flight training, and accident information, are presented.

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14. KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
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